

Notice of Allowability

Application No.

10/776,191

Examiner

Kevin M. Bernatz

Applicant(s)

MA ET AL.

Art Unit

1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 9/8/06.
2. ☒ The allowed claim(s) is/are 1-20.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 20060914.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Election/Restriction

1. Claims 9 – 13 and 20 are allowable. The restriction requirement set forth on December 20, 2005, has been reconsidered in view of the allowability of claims to the elected invention pursuant to MPEP § 821.04(a). **The restriction requirement is hereby withdrawn as to any claim that requires all the limitations of an allowable claim.** Claims 1 – 8 and 14 – 19, directed to inventions no longer withdrawn from consideration because the claim(s) requires all the limitations of an allowable claim.

In view of the above noted withdrawal of the restriction requirement, applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Once a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

Reasons for Allowance

1. The present claims are deemed allowable over the reference Ma et al. (U.S. Patent No. 6,613,422 B1) since the reference is commonly assigned and a terminal disclaimer has been filed to obviate the obviousness-type double patenting rejection.
2. The present claims are deemed allowable over the references of record since the references of record fail to disclose or render obvious a structure comprising a layer of

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undoped tetrahedral amorphous carbon (ta-C) having a mass density of carbon atoms greater than about 2.5 gms/cm^3 and formed on said ta-C layer, a layer of nitrogen-doped tetrahedral amorphous carbon (ta-C:N) having a mass density of carbon atoms greater than 2.0 gms/cm^3 .

Regarding Ma et al., the Examiner concurs with applicants' arguments.

Regarding Fujimaki et al., the Examiner was relying upon an inherency position with regard to a comparative example (*Paragraph 0062*), since Fujimaki et al. desires the second layer (i.e. applicants' ta-C:N layer) to be formed of only carbon (*Paragraph 0005*). With regard to claims 14 – 19, the Examiner further notes that Fujimaki et al. fails to teach or render obvious controlling the ta-C:N layer to possess a mass density of carbon greater than 2.0 gms/cm^3 .

While Jairson et al. disclose forming a carbon layer, which *may* be a ta-C:N layer, on a layer of ta-C having a high carbon mass density, Jairson et al. fail to teach or render obvious the ability to form the ta-C:N layer such that it meets the claimed mass density limitation. Specifically, the Examiner notes that applicants have provided evidence that nitrogen-doped carbon layers formed by a sputtering process allegedly cannot achieve carbon mass densities above 2.0 (*see graph, not in an executed declaration format, submitted with response filed June 30, 2006*). Additional evidence exists in Ma et al. ('422 B1) Figure 2, which shows that only in a narrow range of nitrogen content can a carbon density of 2.0 or higher be achieved by an ion beam deposition (IBD) process. Finally, the Examiner notes that Figure 1 of the present application supports and summarizes these evidentiary teachings regarding the ability

of the various processes to obtain ta-C:N films possessing high carbon mass densities, which is supported by the teaching in Fujimaki et al. ('496 A1) (*i.e. the ability to achieve higher mass density via a filtered cathodic arc deposition (FCAD) process*). However, the Examiner deems that Jairson et al. (232 B2) teaches away from using a FCAD process to deposit the second carbon containing layer, since Jairson et al. desires a *low* carbon mass density for the second film.

As such, the Examiner deems that there is insufficient specificity in the prior art to teach or render obvious the combined use of a layer of undoped tetrahedral amorphous carbon (ta-C) having a mass density of carbon atoms greater than about 2.5 gms/cm³, and formed on said ta-C layer, a layer of nitrogen-doped tetrahedral amorphous carbon (ta-C:N) having a mass density of carbon atoms greater than 2.0 gms/cm³.

3. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

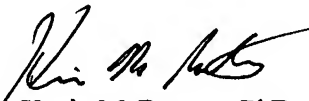
Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB
September 14, 2006


Kevin M. Bernatz, PhD
Primary Examiner